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EMPRESS: Privacy-Preserving Decentralised Educational Analytics with Student Self-Sovereignty

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Supervisors: Prof John Domingue, Dr Allan Third

Knowledge Media Institute

The Open University

MY RESEARCH

Investigate how privacy-preserving Machine Learning can help to achieve ethically principled Decentralised Learning Analytics

RESEARCH MOTIVATION

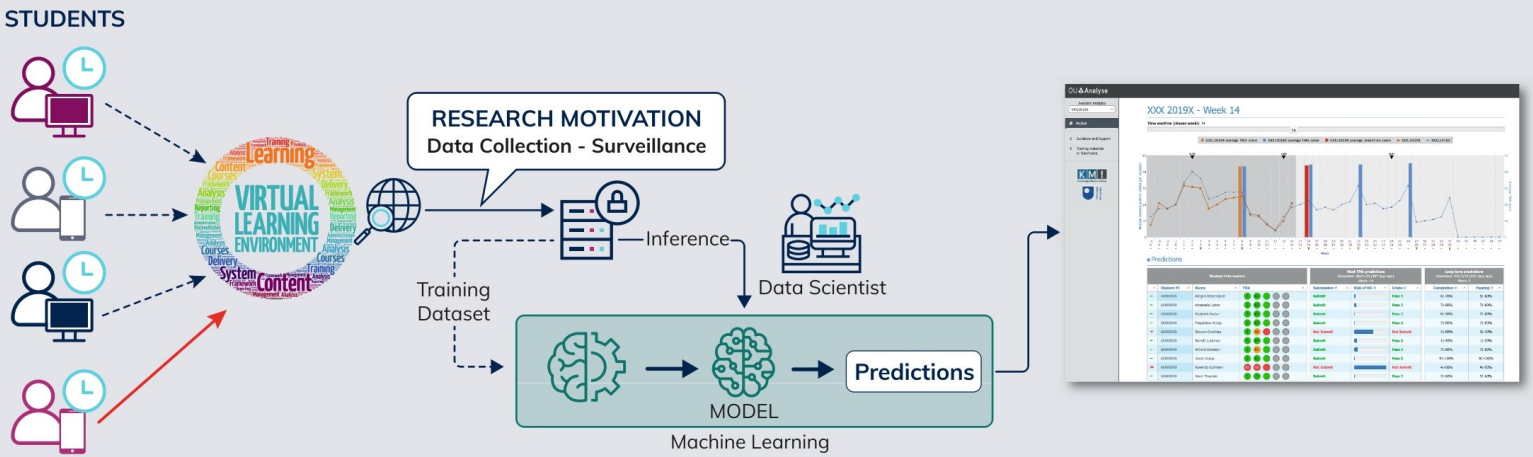
Data Collection - Learning Record Store

- Implicit Opt-In
- No Opt-Out
- Data Lock-In

RESEARCH AREAS

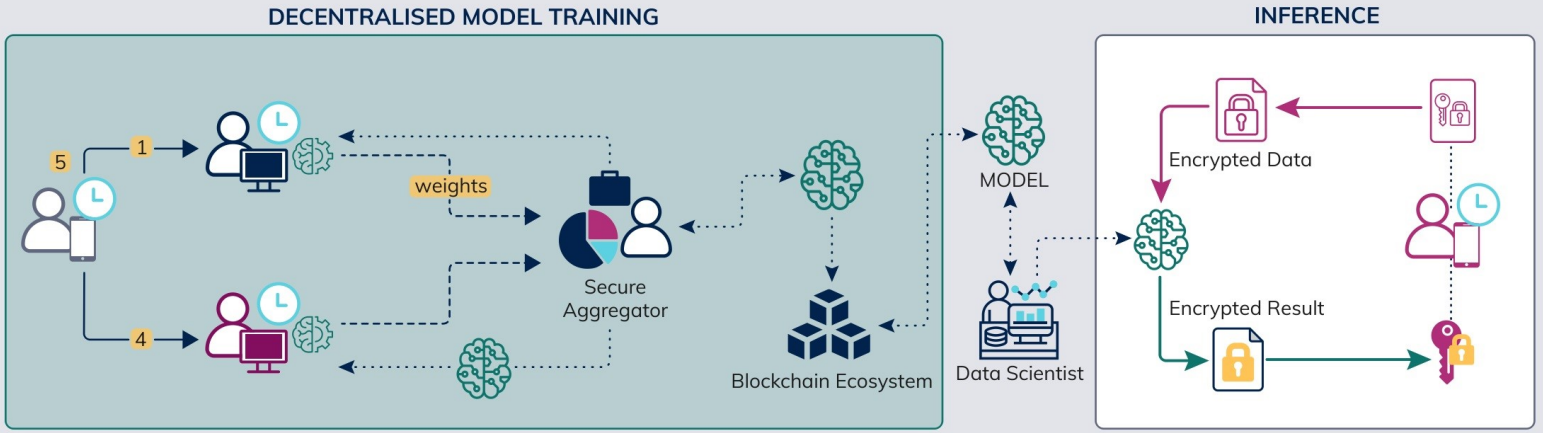
- Secure Multi-Party Computation
  - Data is split between 2 or more parties
- Federated Learning
  - Train a model on unseen data
- Homomorphic Encryption
  - Computation on encrypted data
- Blockchain
  - For verification and rewards

AN EXAMPLE OF LEARNING ANALYTICS TODAY



LEARNING ANALYTICS AT A DISTANCE LEARNING UNIVERSITY

ONE PROPOSED SOLUTION



PRIVACY-PRESERVING MACHINE LEARNING WITH BLOCKCHAIN VERIFICATION